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Feature Article

Historic preservation priorities for climate adaptation

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ABSTRACT

Cultural heritage-specific research is scarce within the climate change literature and climate change policy documents, challenging climate adaptation efforts to minimize adverse impacts on cultural heritage. Engaging and assessing diverse stakeholders' values and integrating those with evidence-based knowledge is critical for timely, effective and transparent preservation and climate adaptation of coastal cultural heritage. This study assessed technical experts' and community groups' opinions about the importance of value-based prioritization considerations to provide more immediate guidance adaptation planning and decision making. The findings from four separate elicitation surveys demonstrated substantial consistency in value-based climate adaptation prioritization preferences for one type of vulnerable cultural heritage: historic buildings in coastal zones in the United States. In particular, the samples of cultural heritage professionals and members of community groups consistently rated spatial importance, uniqueness, and scientific value of historic buildings as very important considerations for climate adaptation prioritization decision-making. Also, consistently evaluated but of relatively low importance were considerations related to the cost of preservation and adaptation treatments, including previous investments. Few statistically significant differences were found among our samples in their perceptions of importance. These findings provide initial guidance to cultural heritage managers, particularly those with scarce financial resources to allocate for adapting coastal historic buildings, and demonstrate the need for continued development of approaches that provide rapid assessment of coastal heritage stakeholders' adaptation priorities.

1. Introduction

While tangible cultural heritage provide socio-cultural, economic and environmental benefits, heritage managers are facing considerable preservation challenges, including budget constraints and deferred maintenance (Fatorić and Seekamp, 2017a; Hill, 2016). Additionally, the volume of cultural heritage designated as significant and those considered to be eligible for official designation, such as being listed on the U.S. National Register of Historic Places or the UNESCO World Heritage List, continues to expand (Baer, 1995; Mason, 2006; Sprinkle, 2007). Climate change compounds the challenges of heritage management by accelerating the deterioration and potential loss of tangible cultural heritage (Rockman et al., 2016). Moreover, heritage managers face numerous institutional, technical and financial barriers, particularly the lack of processes and guidelines for planning and implementing climate adaptation actions (Fatorić and Seekamp, 2017c; Sesana et al., 2018). Yet, adaptation decisions made in the interim often reflect the priorities of site managers and perhaps, in some cases, the most vocal stakeholders (Sprinkle, 2007). Even more concerning are the cases in which nothing is adapted to withstand immediate (e.g., storm-related flooding and erosion) or impending (e.g., sea level rise) deterioration or destruction (Haugen and Mattson, 2011). As heritage losses will likely increase with the accelerated degradation caused by climate change (ICOMOS 2019), guidance for setting preservation and adaptation priorities is needed.

In the U.S., current policy set by the National Park Service (NPS, 2014a) instructs cultural heritage managers to direct climate adaptation decisions to heritage that are both significant and most at risk. Although policy is typically written to enable flexibility, details are lacking for prioritization when diverse heritage are equally vulnerable and equally significant, are highly vulnerable but of low significance, or have low vulnerability but are of high significance. As such, researchers are beginning to address this issue by developing measurement frameworks (Fatorić and Seekamp, 2018), risk analysis frameworks

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(Carmichael et al., 2018), citizen science projects to identify and monitor cultural heritage (Graham, Hambly and Dawson 2017) and optimization models for climate adaptation planning (Xiao et al., 2019). Though relevant and important for informing management decisions, these approaches often require extensive data gathering, which may not be time sensitive to coastal adaptation decision-making that occurs when funding is available. Therefore, additional guidance is needed that is both (a) informed by expert and community groups' values and (b) able to be applied rapidly.

In this paper, we present a study about value-based prioritization considerations for informing coastal adaptation decisions regarding one cultural heritage type, historic buildings. Specifically, we measured opinions about the importance of nine prioritization considerations among two distinct community group members and two distinct sets of technical experts. We compared the relative importance between the community and expert samples, between the community subsamples, and between expert subsamples. These comparisons helped us to explore the similarities and differences among and between samples. Our findings provide heritage managers with more immediate guidance for making adaptation decisions about coastal historic buildings.

1.1. Value-based prioritization considerations for climate adaptation

Over the last three decades, the scientific community and policymakers have made strides to reduce the anthropogenic effects of climate change on various natural and socio-economic systems globally (IPCC, 2014). However, mitigation efforts are not currently meeting carbon reduction goals (Brown et al., 2019), furthering the importance of climate readiness by all sectors (Paas, 2016). Only in the past decade have a small but increasing number of studies and policies begun to address climate adaptation of historic buildings and other built heritage (e.g., Fatorić and Seekamp, 2017a; Leissner et al., 2015; Rockman et al., 2016; Sabbioni et al., 2010; Sesana et al., 2019; UNESCO, 2008).[1] Climate adaptation of historic buildings aims to reduce the damage or optimize opportunities associated with current or potential future climate change impacts (IPCC, 2014). Given the limited ability of a heritage resource to adapt to changing conditions, adaptation actions are considered to be the adaptive capacity of a cultural heritage that reduce exposure, sensitivity, or both (Phillips, 2015; Rockman et al., 2016).

Climate adaptation decision-making is often site-specific and place-based, as adaptation priorities can vary over time, between and within sites, and among diverse stakeholders (Douglas-Jones et al., 2016). The lack of guidance regarding climate adaptation planning and implementation for historic buildings has been recognized as significant barrier within current historic preservation and cultural heritage management efforts (Fatorić and Seekamp, 2017c; Sesana et al., 2018). Failure to design and implement proactive adaptation strategies for historic buildings will likely necessitate reactive management decisions that do not promote adaptive learning, long-term adaptation strategies (Sesana et al., 2019), but result in more costly protection measures in the future (ECONADAPT, 2015). Recent damage on historic buildings—such as a historic building that was built by slaves in Wilmington, North Carolina and damaged during Hurricane Florence in 2018[2]—demonstrates the consequences of failing to take urgent preventive measures against more severe and frequent environmental or climate hazards, as well as the lack of alignment of various government agencies' goals and strategies.

In the United States, rising costs associated with environmental and climate-related hazards (U.S. Global Change Research Program, 2018) and the increasing scarcity of funding for maintenance and management of diverse types of cultural heritage, including historic buildings (Pew Charitable Trusts, 2018), have led to heightened attention of the need to identify and prioritize historic buildings for climate adaptation initiatives (NPS, 2014a; 2014b; Rockman et al., 2016). As financial resources are limited and the scale of the climate-related impacts is large, research is needed to make more informed decisions about what is acceptable in the face of inevitable loss of historic buildings (Sargent and Slaton, 2015; McClure, 2015).

Scholars have only recently began studying how to inform adaptation planning and decision-making processes for prioritizing vulnerable historic buildings. For example, Fatorić and Seekamp (2018) created a novel decision support framework for transparent prioritization of historic buildings based on measurement of buildings' historical significance and use potential; this framework was integrated by Xiao et al. (2019) into an optimization model that also considered adaptation costs and dynamic vulnerability, condition and integrity data during a 30-year planning horizon. Daly (2014) introduced a values-focused approach for evaluating exposure, sensitivity and adaptive capacity of built heritage to more holistically inform adaptation prioritization process. Similarly, Gandini et al. (2018) developed a methodological approach for vulnerability assessment that evaluates the sensitivity and adaptive capacity of historic buildings in flood-prone cities to inform adaptation prioritization.

Focusing on prioritizing World Heritage Sites for adaptation interventions, frameworks that classify and prioritize sites based on their geological and geomorphological context and processes (Howard, 2013), and those which provide regional index-based approaches for assessing exposure to future sea level rise and associated coastal flooding and erosion (Reimann et al., 2018) have also been introduced. Similarly, Forino et al. (2016) and Ronco et al. (2014) suggested risk assessments that support prioritization efforts based on physical characteristics of hazards, and buildings' exposure and sensitivity to risks posed by climate change. Carroll and Aarrevaara (2018) provided a model to evaluate the vulnerability of building materials to climate-related impacts and the level of urgency for their protection to guide prioritization decisions. Furthermore, Ortiz et al. (2014) developed a risk mapping approach combining monuments and historic buildings' vulnerability of materials and structural characteristics with frequency and intensity of various hazards to help guide decisions on prioritizing adaptation actions. Although these studies fill an important knowledge gap on climate adaptation prioritization, the majority of them focus solely on advancing quantitative methodologies and frameworks for evaluating vulnerability or spatial characterization of risks to climate change, rather than including value-based considerations (with exceptions of Daly, 2014; Fatorić and Seekamp, 2018; Gandini et al., 2018; Xiao et al., 2019).

For more robust and legitimate adaptation decision-making processes, different prioritization factors need to be assessed and their differences and similarities considered (Albizua and Zografos, 2014). Work conducted in the field of decision analysis and behavioral decision theory (Keeney, 1992) document how people's values are not only at the core of the risk-related decision-making but also essential to identify when making decisions about managing climate change risks (O'Brien and Wolf, 2010). Values can be defined as "desirable, trans-situational goals, varying in importance, that serve as guiding principles in people's lives" (Schwartz, 1996, 2). Gregory and Keeney (2017) noted that successful decision-making is based on in-depth understanding of both values—that is, what is important to diverse stakeholders in the context of the specific decision—and consequences or what is likely to happen if a management action is implemented. Previous research demonstrates that identifying multiple values (e.g., community groups, decision makers), making trade-offs among diverse values transparent, and assessing the desirability of different management outcomes can lead actors to make more thoughtful and better-informed management and

[1] It should be noted that a separate field of study focuses on assessing the risks to materials and built heritage posed by changing climatic conditions, such as Loli and Bertolin (2018) and Carroll and Aarrevaara (2018).

[2] For more information on Hurricane Florence and its damage in news, see https://psmag.com/environment/hurricane-florence-records-of-americas-slave-trade.

policy decisions (Arvai et al., 2001; Fatorić and Seekamp, 2019; Hermans and Cunningham, 2018; Williams and Fang, 2018). Value-based approaches differ from traditional alternative- or action-based approaches in which management actions are identified and weighted without explicitly incorporating stakeholders' values (Williams and Fang, 2018), whereas value-based approaches place emphasis on integrating multiple actors' values with technical expertise and scientific information to foster more transparent, inclusive and holistic decisions (Espinosa-Romero et al., 2011; Wilson and McDaniels, 2007).

In the historic preservation context, decisions to undertake a certain preservation or management action typically give a priority to a certain set of stakeholders' values (Avrami et al., 2000). For instance, decisions in the management of a historic district may involve protection and adaptation of one building or structure through budget allocation and certain vocal stakeholders' values while efforts to maintain other buildings might be limited or insufficient for continuous preservation (Schupp et al., 2015). While values strongly shape historic preservation decisions (De la Torre et al., 2005), there are few studies that call for understanding a wide range of stakeholders' values and engaging communities when designing and implementing adaptation strategies for historic buildings (Cassar, 2009; Douglas-Jones et al., 2016; Nocca, 2017; O'Brien et al., 2015).[3] This paper documents perceptions of value-based considerations for climate adaptation prioritization made by one type of stakeholder (i.e., associated community groups), as well as technical experts. In doing so, we aim to identify the similarities and differences found within adaptation priorities among community groups and experts. It is our hope that similar assessments can enhance the transparency and timeliness of adaptation planning and decision-making of vulnerable historic buildings.

2. Material and methods

Online survey research—a commonly used methodology in social science research (Fielding et al., 2008; Gideon 2012)—was conducted with four separate samples: two samples of cultural heritage experts and two samples of associated community groups. This methodology was selected because it can be more convenient for both users (e.g., respond when time permits) and researchers (e.g., timeliness of data entry and analysis) and has lower administration cost than telephone or paper surveys (Evans and Mathur, 2018; Loomis and Paterson, 2018). However, it is important to note that our samples are nonprobability samples, which limits the generalizability of our findings (Stern et al., 2014). Each sample received an email invitation and three reminder emails, each with an embedded link to the survey questionnaire.

The community group samples include members of two formally recognized partner organizations of Cape Lookout National Seashore: The Friends of Portsmouth Island (hereafter, FPI Community Group) and the Core Sound Waterfowl Museum and Heritage Center (hereafter, CS Community Group). Cape Lookout National Seashore was designated in 1966 and consists of a 56-mile chain of barrier islands managed by U.S. National Park Service in coastal North Carolina (US) (Fig. 1). Cape Lookout National Seashore has two distinct historic districts, Portsmouth Village and Cape Lookout Village, both of which are formally listed on the National Register of Historic Places. Most of the historic buildings located in the districts are highly vulnerable to coastal flooding and erosion and sea-level rise (Peek et al., 2015). The historic districts are currently uninhabited and serve as remnants of past maritime life on the islands.

[Fig. 1. Cape Lookout National Seashore, North Carolina, US. (Map provided courtesy of K. Bitsura-Meszaros)]

The cultural landscape of Portsmouth Village (on the northernmost island, Portsmouth Island) was listed on the National Register of Historic Places in 1976 and reflects the growth of a community (15 residential homes, a school, a post office and general store, and a church) that followed the establishment of a Life Saving Station in 1894. Although many of these historic buildings (all but 11 homes) are open for public visitation and contain interpretive materials, Portsmouth Village does not receive much public visitation (beyond a biennial event hosted by the Friends of Portsmouth Islands) due to limited access (NPS, 2007). At the southernmost barrier island (South Core Banks) is Cape Lookout Village, which developed from the establishment of the Cape Lookout Light Station in 1859 and, in an area two miles south of the Light Station Complex (listed on the National Register in 1972), a Life Saving Station in 1887, which was later replaced by a Coast Guard Station in 1916 (the Coast Guard Station Complex was listed on the National Register in 1988). Residential homes appeared in the mid-1900s, first as temporary homes for men working for the Coast Guard and their visiting families and later as seasonal fishing camps and second homes. The two complexes, along with 14 of the residential buildings, were designated as a historic district in 2000. Only buildings at the Light Station Complex (the lighthouse and keeper's quarters, which are located two-miles north of the Coast Guard Station and residential buildings), are open to the public. The Light Station Complex area receives high visitation due to the presence of large passenger ferries that depart from the park's main visitor center, which is adjacent to the Core Sound Waterfowl Museum and Heritage Center (NPS, 2005).

The members of the community groups not only represent those individuals with direct association with the buildings in the two historic districts (e.g., former residents or descendants/relatives of former residents) but also nearby residents with ties to historic villages and other general publics (e.g., general park visitors who decided to donate to one or both of the organizations). Members listed within the community groups' email member databases received the initial solicitation email (tailored to the specific group). Due to the listserv-type email management systems used, we could not track individuals or assess the total number of valid email addresses for each community group sample. Individuals who were forwarded the survey link were not blocked (but IP addresses were tracked so that only one survey could be completed from a unique IP address). In total, 359 members participated in one of the community group surveys (some were members of both organizations and we used a screening page to determine current and former membership in one, both, or none of the organizations). After data cleaning (including removing 34 non-members and 29 respondents who identified as current members of both organizations), 203 useable responses were retained for analysis ($n = 87$ from the FPI Community Group; $n = 116$ from the CS Community Group).

One of the expert samples included cultural heritage management and historic preservation experts working in the southeastern US identified by regional and nation-level staff of the United States Department of the Interior, National Park Service (hereafter, NPS-identified Experts). The other expert sample was composed of historic preservation and cultural heritage management experts attending the 2018 Climate Heritage Network workshop (hereafter, CHN-identified Experts). The NPS-identified Experts sample was strategically derived by the NPS Southeast Regional Office and Washington, DC Office and included experts from federal and state governments, non-profit organizations, academia, and private architectural and engineering firms. In 2017, the list of 85 experts were contacted via telephone to describe the study and solicit participation (6 individuals were removed from the sample after expressing that they lacked expertise on the topic); for those that agreed to participate, we sent the invitational and reminder emails. A total of 39 NPS-identified Experts completed the questionnaire (response rate of 49%). The CHN-identified Expert sample used convenience sampling (Emerson, 2015) by soliciting all participants at the 2018 Climate Heritage Network workshop, which was an invitational event associated with the Global Climate Action Summit held in San Francisco, California (US). Following the workshop, we sent the 37 workshop participants

[3] We would like to acknowledge the work that is being conducted by Carmichael and colleagues (2017, 2018) to integrate indigenous values into archeological climate adaptation planning in Australia.

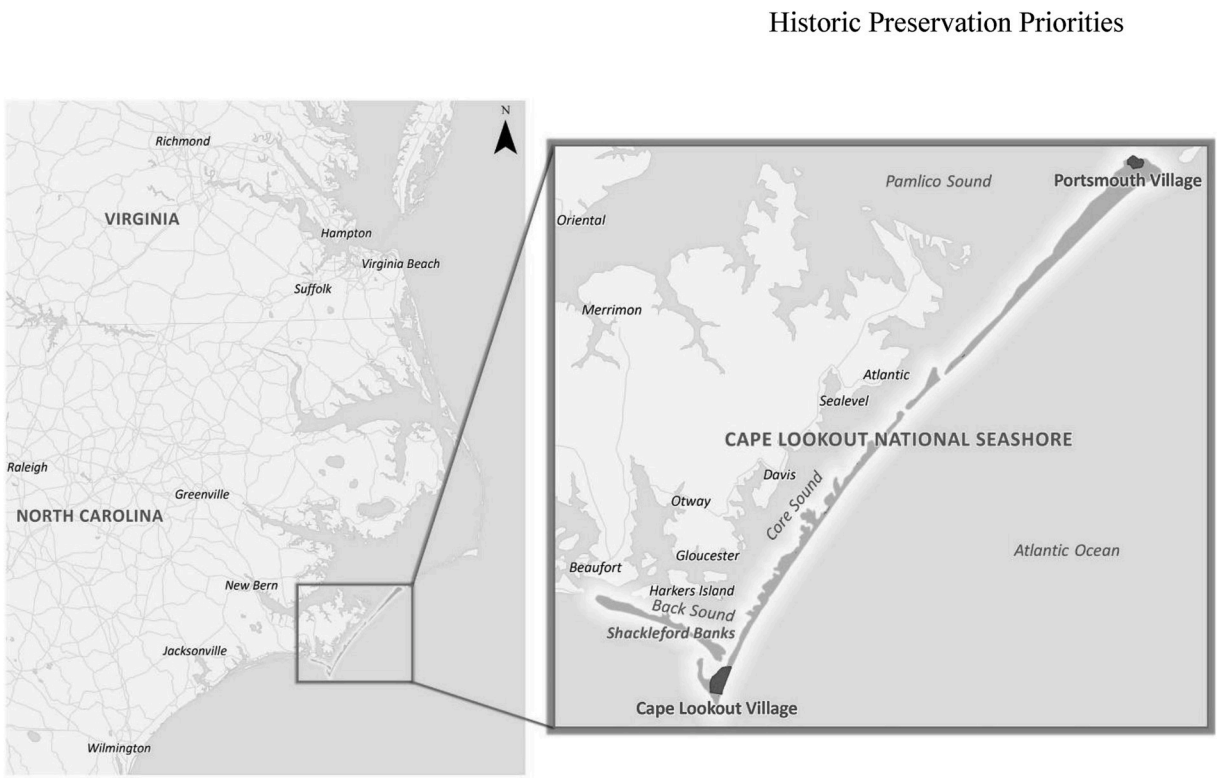

Fig. 1. Cape Lookout National Seashore, North Carolina, US. (Map provided courtesy of K. Bitsura-Meszaros).

(from the U.S., Europe, Central America, and South America) the invitational and reminder emails (two individuals removed from the sample after expressing that they lacked expertise on the topic). A total of 23 CHN-identified Experts completed the survey (62% response rate).

The adaptation prioritization considerations were conceptualized from a review of those identified during a National Park Service workshop in 2014 (NPS, 2014b) and refined in consultation with National Park Service officials from the Climate Change Response Program who sponsored and lead that workshop. The instrument and protocols were reviewed and approved by the lead-author's Institutional Review Board (IRB) for work with human subjects, as well as the U.S. Office of Management and Budget (OMB) for compliance with the Paperwork Reduction Act (OMB Control Number 1024-0278). All respondents were asked to indicate the importance (5-point Likert-type scale from "*not at all important*" to "*extremely important*") of different considerations for the prioritization of historically designated buildings for coastal adaptation planning. Within this section of each survey, we first explained that "strategies are needed to adapt cultural resources in dynamic, changing landscapes." Then, we explained that we were interested in learning about respondents' (exact wording was "your") perceptions of how to prioritize historically designated buildings. Specifically, the lead-in to the list of prioritization criteria stated, "How important is that prioritization be placed on structures that …. " Respondents from the expert samples were presented with 20 separate considerations (4 economic, 3 social, 1 scientific, 4 historic, 3 utilitarian, 5 vulnerability). Respondents from the community group samples were presented with a subset (3 economic, 3 social, 1 scientific, 2 historic) of those considerations to reduce the cognitive burden of these non-experts. Each survey had additional measures not reported here.

To explore for differences in perceptions prioritization considerations, we used nonparametric statistics—specifically, Mann-Whitney U tests—to compare responses between the collective sample of experts and the collective sample of community group members. We also compared the subsamples of experts, as well as the subsamples of community groups. The Mann-Whitney *U* test is a nonparametric test that does not assume normal distribution of responses for each independent group and data does not have to meet a test of homogeneity. Further, our data were ordinal and comparisons were made between nominal-based groups that were mutually exclusive, meeting the requirements of this analytic approach. All data were analyzed using the Statistical Package for the Social Sciences (SPSS) v.25 software. It is important to note that the goal of our paper is not to generalize to a wider population (due to the unknown sample populations) but rather to determine the similarities and differences within and between heritage preservation experts' and community groups' perceptions of important climate adaptation prioritization considerations. Although our samples are non-random, we tested for significance between our community group and expert samples and within the subsamples; however, we did not apply a multiple comparisons significance-level correction to the three sets of comparisons (between technical experts and community groups, between technical experts subsamples, between community group subsamples) due to the exploratory nature of this research. Instead, we sought to explore where the potential for significant differences between opinions emerged, which we further illustrate in box-and-whisker plots to enhance understanding of any such differences. For reference purposes, we present mean, median and standard deviations in an appendix for the full sample, the combined expert sample, the combined community group sample, and each of the expert and community group subsamples, as we list priorities in descending order of importance in our results section.

3. Results

3.1. Respondent profiles

The NPS-identified Expert sample (n = 39) reported working in their current position and with their current organization 9 and 13 years, on average, while their average experience working in cultural heritage management or historic preservation was 23 years (Table 1). The NPS-identified Expert sample was comprised predominantly of cultural

heritage experts working in federal government (44%), state government (20%), and the private sector (15%). Other sectors included: nongovernmental organizations (10%), academic and research institutions (8%) and local government (3%). NPS-identified Experts reported working in an average of three geographic regions (range: 1–11). Nearly half of NPS-identified Experts (43%) reported conducting the majority of their work along the U.S. Atlantic Coast, with another 21 percent on the Gulf Coast and relatively few in other U.S. coastal contexts (6% Great Lakes, 5% Pacific Northwest, 5% California, 4% Caribbean, and 2% Pacific Islands; other non-coastal contexts: 13%).

The CHN-identified Expert sample (n = 23) reported working in their current position and with their current organization 7 and 9 years, on average (Table 1) Their average heritage management or historic preservation experience was 19 years. The CHN-identified Expert sample predominantly reported working in non-governmental organizations (35%), the academic or research institution (22%), and the private sector (17%). Other sectors included: local government (13%), federal government (9%), and state government (4%). The CHN-identified Expert sample represented a diversity of geographic work areas and CNH reported working in an average of 5 geographic regions (range: 1–18), with the largest proportion reporting that they conduct the majority of their work in the U.S. (78%; 20% along the U.S. Atlantic coast, 8% California, 7% Gulf coast, 7% Caribbean, 7% Pacific Northwest, 7% Pacific Islands, 5% Great Lakes, and 17% other US non-coastal contexts). Outside of the U.S., work locations included: Central and South America (7%), Europe (4%), North America (non-U.S.; 3%), Asia (3%), Australia and Oceania (3%), and Africa (3%).

For individuals in the FPI Community Group sample (n = 87), the average age was 67 years and 46 percent of the sample was female (Table 1). Over one-quarter (28%) of the FPI sample had formerly lived within (or had family that had) the historic districts now being managed by the NPS. On average, the FPI sample had visited the historic districts twice in the prior 12 months.

Within the CS Community Group sample (n = 116), the average age was 66 years and 44 percent of the sample was female (Table 1). About 10% of the CS Community Group had previously lived (or had family that had lived) within the historic districts. On average, the CS Community Group sample visited the historic districts with which they are affiliated four times in the prior 12 months.

3.2. Prioritization priorities

Consistent prioritization priorities were found among the expert subsamples (Figs. 2–4). Each of the expert subsamples rated two historic considerations as being of most importance (median of "extremely important") for setting priorities were: (a) a symbol of national importance and (b) uniqueness. Additionally, each of the expert subsamples rated a mix of considerations as being of high importance (median of "very important"): (a) scientific value, (b) being central to the cultural landscape, (c) being foundational to a community, (d) those most immediately impacted by storm-related flooding and erosion, (e) those most immediately impacted by sea level rise, (f) meaningfulness to a community of people, (g) having high interpretive potential, (h) those most visited by the public, (i) serve a programmatic function, (j) those

Table 1
Respondent profiles by sample.

	NPS-identified Experts n = 39	CHN-identified Experts n = 23	FPI Community Group n = 87	CS Community Group n = 116
Years in current position *Mean (SD)*	9.2 (6.56)	7.2 (5.37)		
Years with current organization *Mean (SD)*	13.2 (5.89)	9.0 (6.93)		
Organizational affiliation (%)				
Federal government agency	44	9		
State government agency	20	4		
Local government agency	3	13		
Nongovernmental organization (NGO)	10	35		
Academic or research institution	8	22		
Private sector	15	17		
Regions in which heritage work is conducted[a] (%)				
North Atlantic	8	9		
Mid Atlantic	10	9		
South Atlantic	25	5		
Gulf Coast	21	7		
Caribbean	4	7		
Great Lakes	6	5		
Rocky Mountain	6	6		
Central	6	4		
Southwest	1	7		
Pacific Northwest	5	7		
California	5	8		
Pacific Islands	2	7		
North American (non-US)	n/a	3		
Asia	n/a	3		
Central and South America	n/a	7		
Asia	n/a	3		
Europe	n/a	4		
Australia and Oceania	n/a	3		
Africa	n/a	3		
Former (or family was) owner/lessee *%*			27.5	10.3
Number of past visits *mean (SD)*			4.40 (7.08)	7.61 (9.17)
Age *mean (SD)*			67 (10.83)	66 (8.76)
Gender *% female*			46	44

[a] Respondents could select all areas that apply. NPS-identified Experts reported an average of 3 geographic regions (range: 1–11). CNH-identified Experts reported an average of 5 geographic regions (range: 1–18).

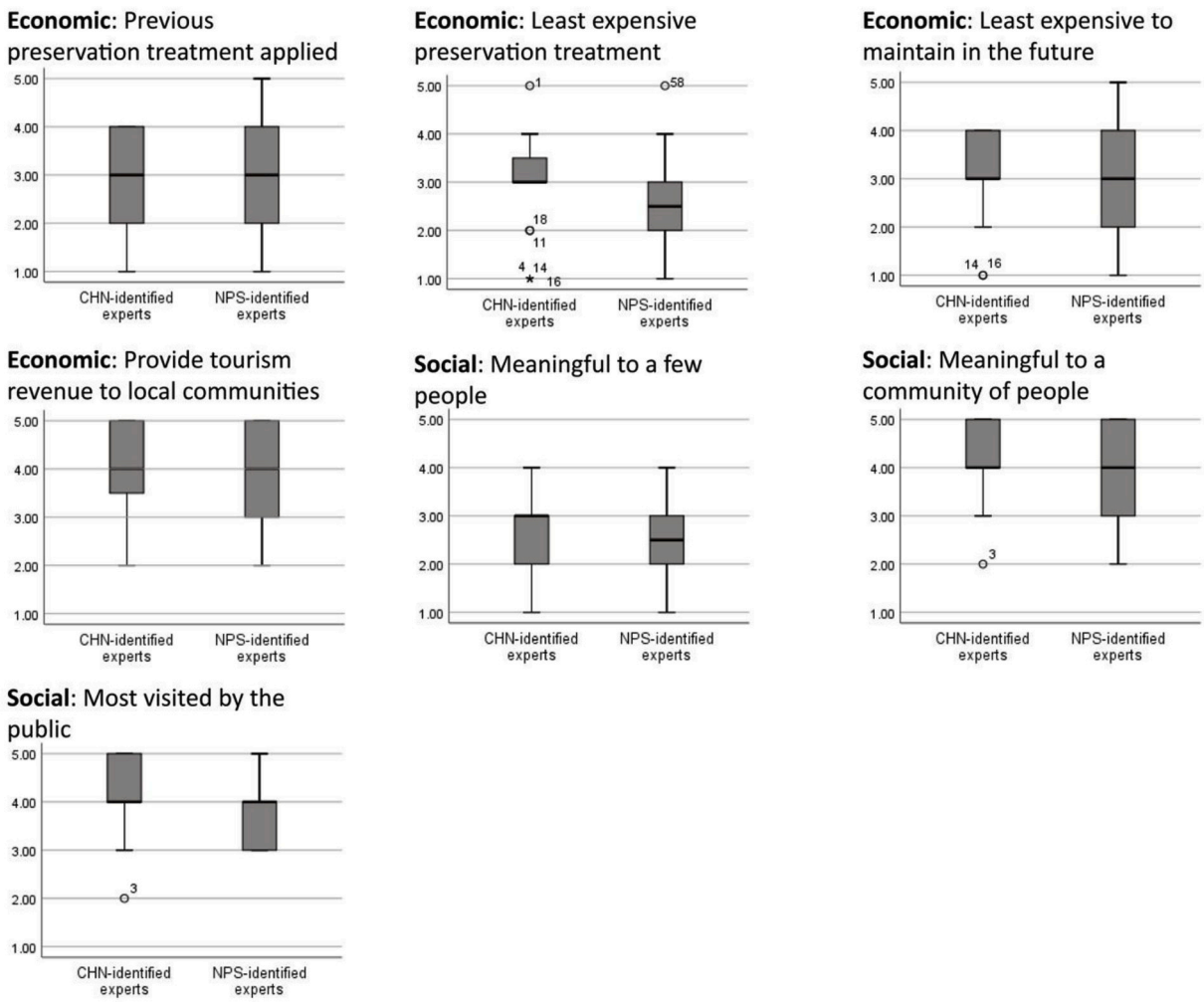

Fig. 2. Comparisons of expert subsamples: boxplots of economic and social considerations.

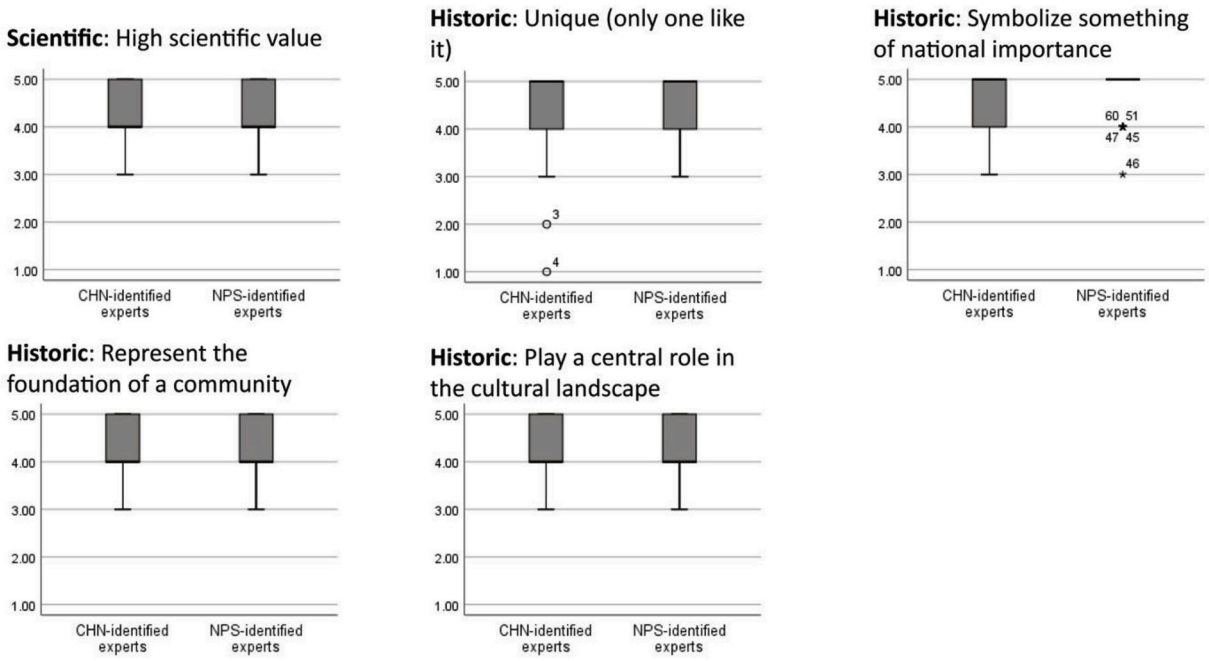

Fig. 3. Comparisons of expert subsamples: boxplots of historic and scientific considerations.

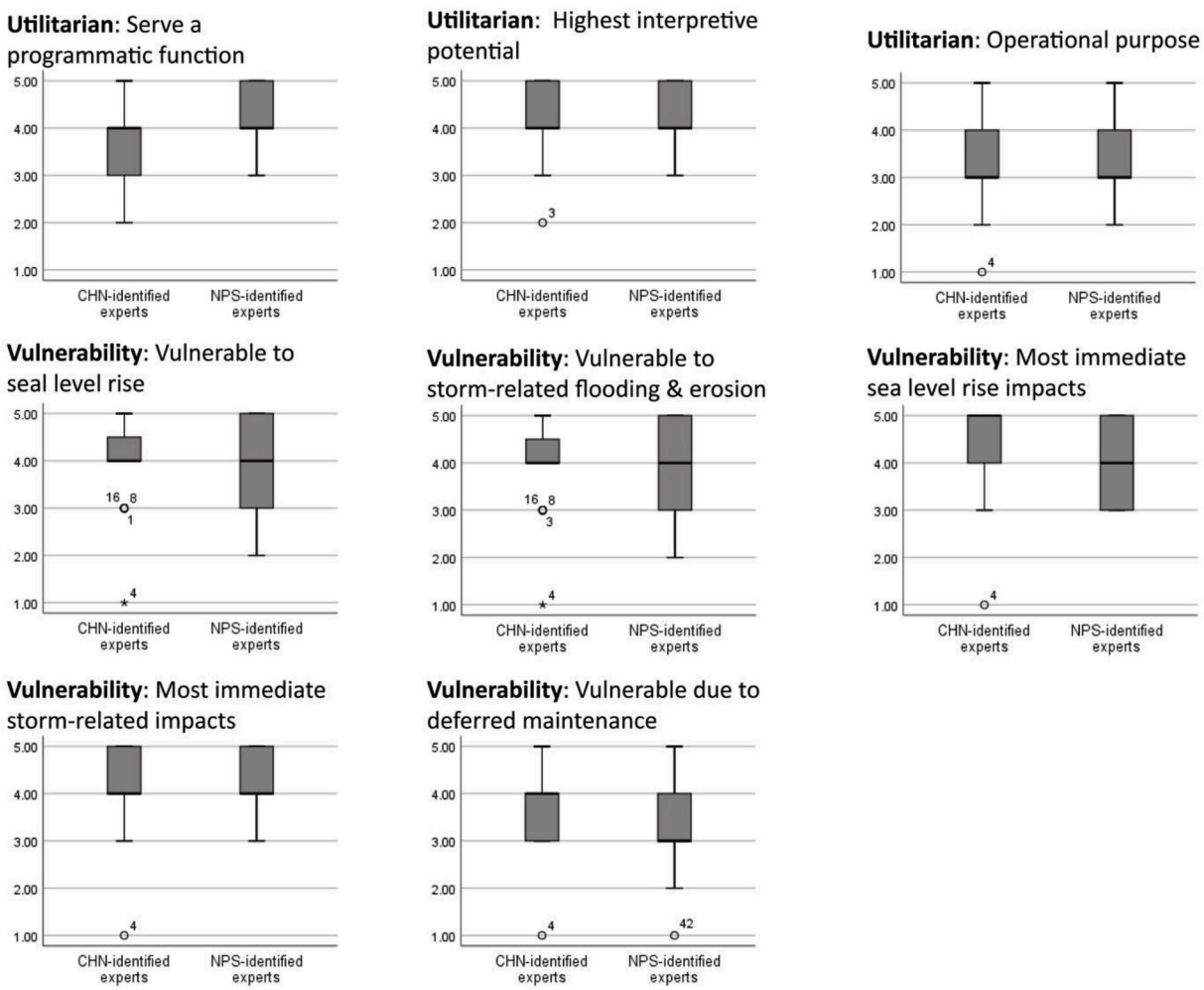

Fig. 4. Comparisons of expert subsamples: boxplots of utilitarian and vulnerability considerations.

most vulnerable to storm-related flooding and erosion, (k) those most vulnerable to sea level rise, (l) provide significant tourism revenue for local communities, and (m) those most vulnerable due to deferred maintenance. The subsamples of experts rated most economic considerations to be of "moderate importance": (a) having a previous preservation treatment, (b) those least expensive to maintain in the future, and (c) having the least expensive treatments. Additionally, the subsamples of experts also rated one operational and one social consideration to be of "moderate importance": (d) holding an operational purpose and (e) are meaningful to only a few people). There were no statistically significant differences in responses (Table 2) when the two expert subsamples were compared to one another, and neither sample consistently rated all considerations higher than the other sample in terms of importance.

For the community group subsamples, three statistically significant differences were found in their prioritization priorities (Figs. 5 and 6; Table 2). In general, the FPI Community Group respondents consistently rated the priorities of being of greater importance than the CS Community Group respondents. Similar to the expert subsamples, the community group subsamples also rated two historic considerations as most important considerations (median of "extremely important") for setting priorities: (a) uniqueness and (b) a symbol of national importance; however, the FPI Community Group respondents rated uniqueness as more important than the CS Community Group respondents ($U = 4233.00$, $Z = -2.21$, $p = .027$; Table 2). Additionally, the community group subsamples rated a mix of considerations as being "very important": (a) meaningfulness to a community, (b) scientific value, (c) those most visited by the public, and (d) previously having a preservation treatment. Again, the FPI Community Group respondents rated two considerations [having had a previous preservation treatment ($U = 4236.00$, $Z = -2.04$, $p = .042$) and being the most visited by the public ($U = 4177.00$, $Z = -2.21$, $p = .027$)] as being of greater importance than CS Community Group respondents. The considerations of "moderate importance" to each community group subsample, one of which was rated as more important to the FPI Community Group respondents than the CS Community Group respondents, included: (a) meaningfulness to a small group ($U = 4109.00$, $Z = -2.35$, $p = .019$), (b) being the least expensive to maintain in the future, and (c) having the least expensive treatment.

When comparing the combined sample of expert and the combined sample of community group respondents across the nine shared items, four statistical differences were found (Figs. 7 and 8; Table 2). Specifically, the expert sample rated two items as being more important considerations than community group sample: having high scientific value ($U = 5122.50$, $Z = -2.19$, $p = .029$) and symbolizing something of national importance ($U = 5039.00$, $Z = -2.48$, $p = .013$). Having high scientific value was rated as the third and fourth most important considerations for the expert sample and community group sample, respectively; the box plots reveal that, despite equal median values, the community group sample was affiliated with a greater range of responses than expert sample. Symbolizing something of national importance was rated as the first and second most important considerations for the expert sample and community group sample, respectively; the box plots reveal that, despite equal median values, the differences may be

Table 2
A comparison of prioritization priorities between combined samples and within subsamples of technical experts and community groups.

Preservation Considerations[a]	Mann-Whitney *U* Test Results		
	Comparing Experts to Community Groups	Comparing Expert Subsamples	Comparing Community Group Subsamples
Economic Considerations			
Previously had previous preservation treatment[b]	U = 4320.50, Z = −3.72 ***p < .001***	U = 430.50, Z = −0.10 *p = .920*	U = 4236.00, Z = −2.04 ***p = .042***
Have the least expensive treatment(s)[c]	U = 6098.50, Z = −0.19 *p = .852*	U = 344.50, Z = -1.43 *p = .153*	U = 4469.00, Z = −1.46 *p = .143*
Are the least expensive to maintain in the future	U = 6087.50, Z = −0.21 *p = .835*	U = 3 58.00, Z = −1.22 *p = .244*	U = 4703.50, Z = −0.87 *p = .385*
Provide significant tourism revenue to local communities		U = 384.00, Z = −0.83 *p = .405*	
Social Considerations			
Are meaningful to a few people (a family)	U = 4875.50, Z = −2.63 ***p = .009***	U = 385.50, Z = −0.82 *p = .414*	U = 4109.00, Z = −2.35 ***p = .019***
Are meaningful to a community of people	U = 5944.00, Z = −0.50 *p = .616*	U = 361.00, Z = −1.21 *p = .226*	U = 4283.50, Z = −1.94 *p = .052*
Are the most visited by the public	U = 6179.50, Z = −0.02 *p = .981*	U = 350.00, Z = −1.41 *p = .158*	U = 4177.00, Z = −2.21 ***p = .027***
Scientific Considerations			
Have the highest scientific value (help us better understand aspects of the past)	U = 5122.50, Z = −2.19 ***p = .029***	U = 380.00, Z = −0.93 *p = .355*	U = 4562.00, Z = −1.24 *p = .214*
Historic Considerations			
Hold particular historical value because of its uniqueness (e.g., only one like it).	U = 6063.00, Z = −0.28 *p = .782*	U = 392.50, Z = −0.75 *p = .451*	U = 4233.00, Z = −2.21 ***p = .027***
Symbolize something of national importance	U = 5039.00, Z = −2.48 ***p = .013***	U = 346.50, Z = −1.66 *p = .096*	U = 4821.00, Z = −0.60 *p = .548*
Represent the foundation of a community (e.g., is the reason other structures were built).		U = 357.00, Z = −1.29 *p = .198*	
Play a central role in the cultural landscape (e.g., prominent)		U = 419.00, Z = −0.30 *p = .761*	
Utilitarian Considerations			
Serve a programmatic function (e.g., contributing factor to the designation of the site)		U = 363.00, Z = −1.22 *p = .224*	
Hold the highest interpretive potential (e.g., link to the site's interpretive plan)		U = 423.00, Z = −0.23 *p = .822*	
Hold an operational purpose (e.g., currently serves as a visitor center)		U = 397.00, Z = −0.63 *p = .530*	
Vulnerability Considerations			
Are the most vulnerable to sea level rise (severity of risk).		U = 390.00, Z = −0.74 *p = .457*	
Are the most vulnerable to storm-related flooding and erosion (severity of risk).		U = 407.50, Z = −0.47 *p = .640*	
Will have the most immediate sea level rise impacts (urgency of action).		U = 363.00, Z = −1.18 *p = .239*	
Will have the most immediate storm-related flooding and erosion impacts (urgency of action).		U = 385.00, Z = −0.84 *p = .400*	
Are the most vulnerable due to deferred maintenance.		U = 347.50, Z = −1.42 *p = .156*	

[a] The question items followed the lead-in question, *How important is it that prioritization be placed on structures that ….*
[b] Question item wording was slightly different on the community group instruments ("are the least expensive to restore", as it was determined that the term "preservation treatment" may not be clear to respondents.
[c] Question item wording was slightly different on the community group instruments ("have been previously restored"), as it was determined that the term "preservation treatment" may not be clear to respondents.

due to some outliers in the community group sample who reported that this consideration was of little to no importance. Respondents in the community group sample rated two items as being more important considerations than those in the expert sample: having had a previous preservation treatment (U = 4320.50, Z = −3.72, $p < .001$) and meaningfulness to a small group of people (U = 4875.50, Z = −2.63, $p = .009$). Having had a previous preservation was rated as the sixth most important consideration for both the expert sample and community group sample; the box plots reveal differences median values (3.00 and 4.00, respectively) and document that respondents in the expert sample typically had a greater range of responses than the community group sample. Being meaningful to a small group of people were rated as the ninth and seventh most important consideration for both the expert sample and community group sample; the box plots reveal that, despite equal median values, the differences are related to respondents in the community group sample having a greater range of responses than the expert sample.

4. Discussion

Climate change compounds the traditional budgetary challenges facing cultural heritage preservation (Fatorić and Seekamp, 2017b; Hill, 2016). Moreover, the predominant top-down approach to heritage preservation decisions has been criticized by scholars, such as Wells and Lixinski (2016), for privileging "the values of a small number of heritage experts over the values of the majority of people who visit, work, and reside in historic environments" (345). Although adaptation frameworks for providing guidance are on the rise, some of which specifically

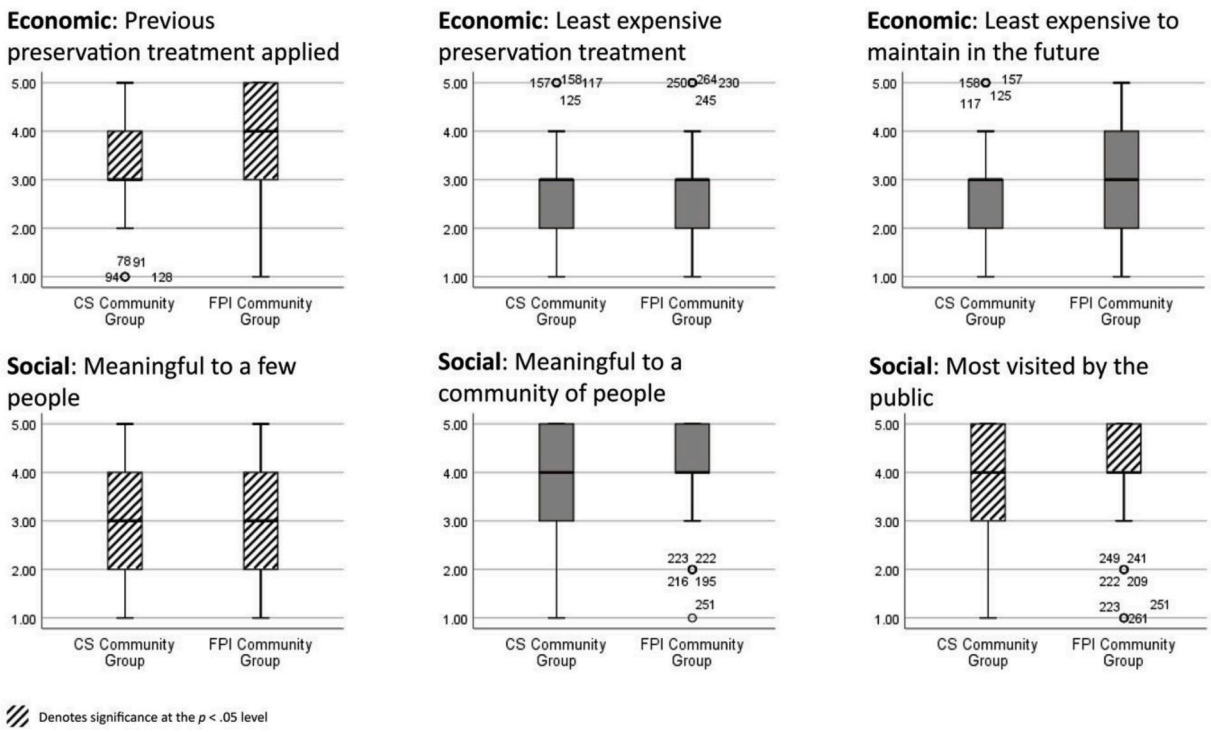

Fig. 5. Comparisons of community group subsamples: boxplots of economic and social considerations.

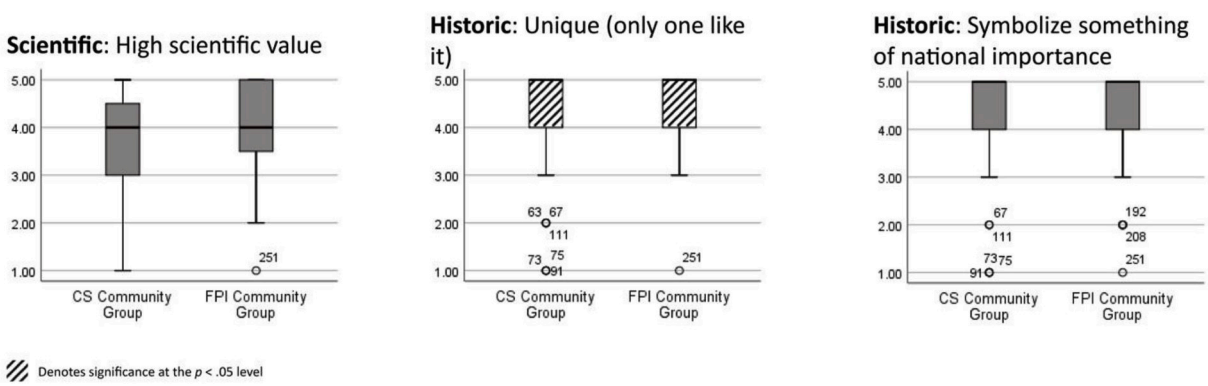

Fig. 6. Comparisons of community group subsample: boxplots of historic and scientific considerations.

include value-based assessments of significance (e.g., Carmichael et al., 2018; Fatorić and Seekamp, 2018), the data-driven nature of these decision support tools limit the timeliness of adaptation decision-making.

Our study provides exploratory evidence that heritage experts and external constituents (i.e., community groups that represent members of a park's formally designated partner organizations) share many similar opinions about the importance of value-based prioritization considerations for the adaptation of historic buildings to climate change, particularly in relation to what they rate as the most (historic considerations) and least important considerations (economic considerations). This finding of consistency in preferences among technical experts and community groups provide managers with tangible guidance: when faced with situations in which rapid decision making is needed, technical expertise may be sufficient if there isn't time for stakeholder engagement or formal consultation. However, it is important to note that the approach used in this paper is a non-critical approach to the preservationist paradigm that resulted in most contemporary listings on the National Register of Historic Places, which has been critiqued as undemocratic and engendering social justice issues (e.g., Wells, 2017; Kaufman, 2009). Future research should specifically measure historically marginalized groups' perceptions of climate adaptation priorities for historic buildings.

An important consideration shared among our samples was the historical value of a building related to its uniqueness (defined in our survey as "the only one like it"). Despite the significant difference ($p < .05$) found between community groups in their responses to this consideration, both community groups rated it as one of the most important considerations, suggesting limited differences in terms of practical significance. Although uniqueness is often referenced as a consideration for heritage designation, policy and research guidance on how uniqueness is defined is limited. For example, one of the ten World Heritage Site designation criteria include reference to uniqueness in relation to the property's testimony to a cultural tradition or civilization; however, the only guidance provided is related to the listing of towns no longer inhabited, which outlines that uniqueness includes "purity of style, for the concentrations of monuments they contain and sometimes for their important historical associations" (UNESCO, 2017, 82).

In the U.S., the ambiguities of policy guidance on defining the significance, importance, and uniqueness of historic properties for listing on the National Register of Historic Places has long been documented (e.

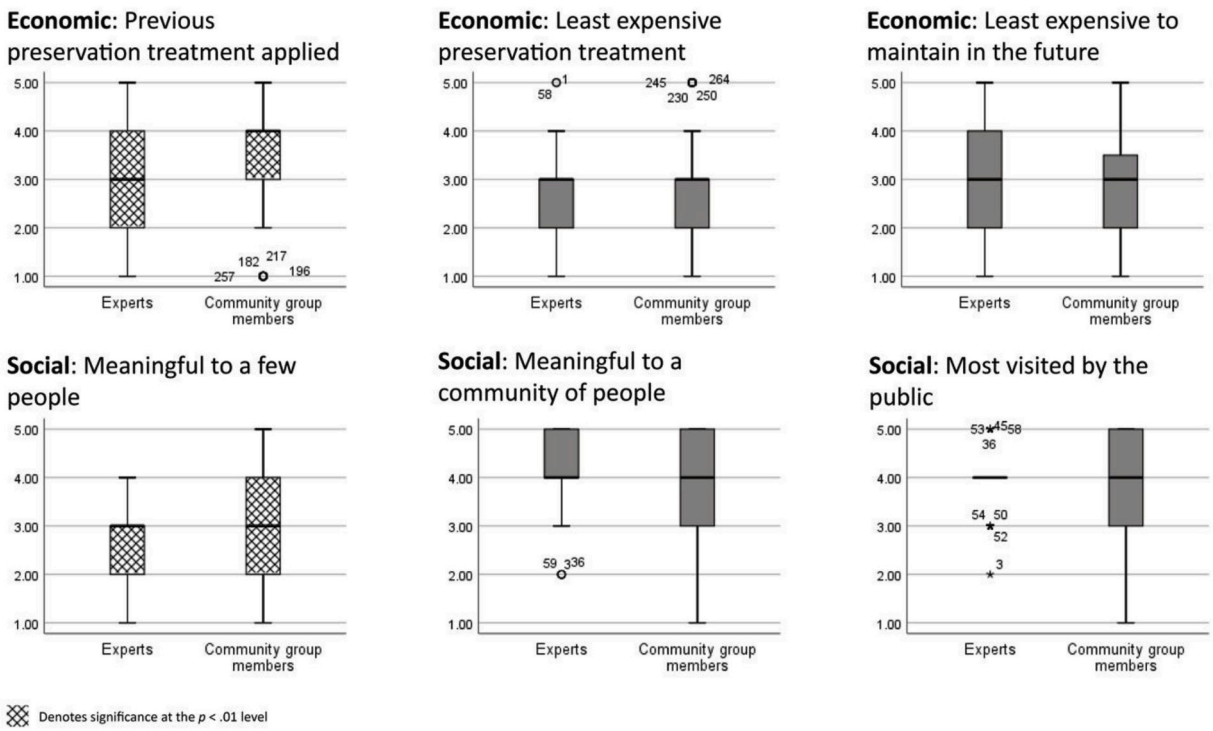

Fig. 7. Comparison of expert and community group combined samples: boxplots of economic and social considerations.

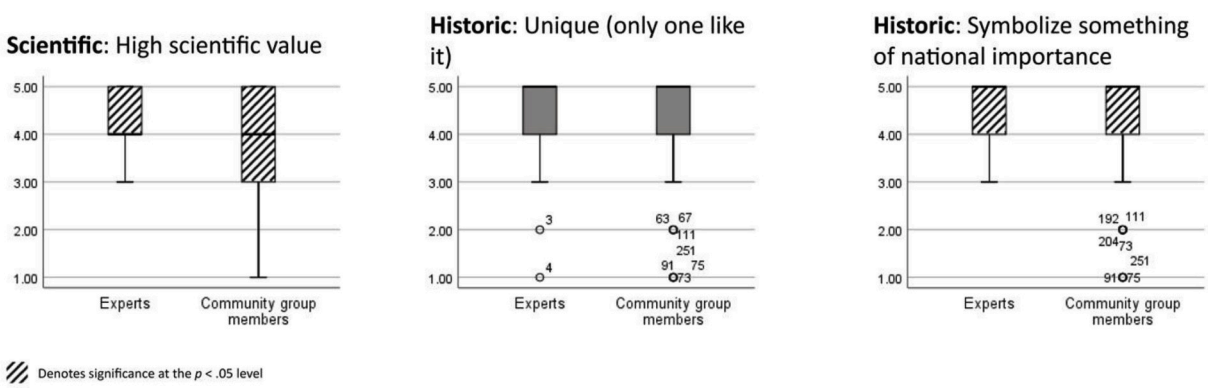

Fig. 8. Comparison of expert and community group combined samples: boxplots of historic and scientific considerations.

g., Tainter and Lucas, 1983). Yet, researchers are working to develop definitions that can enhance transparency in decision-making. For example, Fatorić and Seekamp's (2018) framework that includes the original historic function of a building in relation to the presence or absence of buildings with similar historic functions at varying spatial scales, such as within districts, a park unit, or a region. In a marine spatial planning-context, Gee et al. (2017) suggested a cultural uniqueness as one criterion for determining the significance of cultural features, with cultural uniqueness determined by assessing if a feature is unique within a region or if similar features exist in the same region. Similarly, "rarity" has been considered in archeological frameworks for coastal adaptation planning (e.g., Dawson, 2013; Fatorić and Seekamp, 2019; Pollard-Belsheim et al., 2014). Given the importance of this consideration for prioritizing coastal adaptation, more research is needed to expand upon the measurement of uniqueness for policy guidance and decision-making.

We also found that technical experts and community groups rated the symbolism to national heritage as being of high importance for making prioritization decisions. Despite a statistically significant difference ($p < .05$) between the experts and community groups, historic buildings that serve as symbols of national importance were rated among the two most important considerations by both experts and community groups.[4] This finding suggests that the statistical differences may not hold implications for practitioners; in other words, a historic building that symbolizes national heritage should be a key consideration in future prioritization efforts. Interestingly, specificity to national significance has been somewhat downplayed in U.S. policy documents, as it was a key criterion in the *Antiquities Act of 1906* and the *Historic Sites Act of 1935* but just one of several considerations in the *National Historic*

[4] The outliers within the community groups suggest that there may be some dissenting voices among community groups, which may create a challenge if adaptation decisions are based on this consideration alone if these voices represent politically powerful stakeholders.

Preservation Act of 1966[5] when the legislation was expanded to include the consideration of cultural heritage types at varying spatial scales. Yet, recent research documents the importance of and a desire to account for the spatial scale of significance designations within the National Register of Historic Places in (a) heritage significance measurement frameworks for buildings located in historic districts (Fatorić and Seekamp, 2018) and (b) technical experts' preferences for adaptation prioritization of archeological sites (Fatorić and Seekamp, 2019).

We also found that meaningfulness to a community of individuals is an important consideration for both sets of stakeholders. However, assessing meaningfulness will likely be a substantial challenge to apply in decision-making processes. For example, Carmichael et al.'s (2018) work with Indigenous Rangers and Traditional Owners of archeological sites in Australia documents the challenges associated with a community of individuals viewing all of their cultural heritage as "very important." These researchers were able to overcome this challenge by creating three levels of significance—all of which still recognized each site as very important—through the classification of archeological sites as possessing: group identity value (lowest), historic value, or spiritual value (highest). Future studies are needed to determine how to synthesize the potential disparities of spatial scales for prioritizing cultural heritage that is important to a local community but not considered to be of national (or international) importance. Additionally, research is needed to define what constitutes a community of individuals, which does not appear to have any formal definition within heritage policies beyond UNESCO's definition for intangible heritage (a self-ascribed sense of connectedness, as cited by Arizpe, 2015). Our findings provide some direction, as buildings that are meaningful to only a few individuals was viewed as only being somewhat important for making climate adaptation prioritization decisions. Yet, the statistically significant difference between technical experts and community groups ($p < .01$) and between the community groups ($p < .05$) suggest the need for more research—and likely better defining the "who" within those few people[6]—given variations in the range of opinions.

It was not necessarily surprising that experts reported having high scientific value as being more important than community groups (statistically significant difference; $p < .05$). However, we were surprised that most community group respondents viewed this consideration as being "very important" and just slightly less than meaningfulness to a community of individuals. The implications of this finding are two-fold. First, high scientific value is an important consideration when prioritizing historic buildings for climate adaptation, and a recognized component of a heritage site's cultural value both in the literature (e.g., Throsby, 2012) and policy (e.g., NPS, 1966). However, research is needed to help managers rapidly assess the relative scientific value of historic buildings, as limited work has been carried out to measure scientific value (e.g., Australia ICOMOS, 2013). Second, this nearly equal weighting of community and scientific values, by community groups, holds promise that findings are likely generalizable (despite our inability to assess external validity), as external constituents are often thought to underestimate the value of science in relation to their own vested interests, such as how self-interest (economic values) and place identity (social values) can be more predictive of climate policy support or opposition than scientific consensus (Clayton et al., 2015).

The immediacy of climate change impacts was also a key consideration for the technical experts, as well as the centrality of the building in a cultural landscape (note: community groups were not asked to rate these items). In terms of the former (immediacy of impacts), this prioritization consideration meets current policy guidance (NPS, 2014a) and work is underway to assess relative vulnerability (e.g., Gandini et al., 2018; Reimann et al., 2018; Vojinovic et al., 2016). Yet, additional research is needed to determine: (a) how to weight vulnerability considerations in relation to other heritage value considerations (an implicit value judgment), such as uniqueness and symbolic of national heritage (both of which were rated as being of greater importance for making prioritization decisions than the vulnerability considerations), and (b) the extent to which other stakeholder groups (e.g., members of community groups) rate the importance of this consideration for making prioritization decisions. Related to the centrality of a historic building in a cultural landscape, our intention was to include perceptions of the assessment of the role a building plays within the landscape, which could also be considered a proxy for the integrity criterion, "feeling," within cultural landscape listing criteria for the National Register of Historic Places (also note that feeling is often considered to be an intangible aspect related to how physical features convey historic character of a building; NPS, 1997). For example, would a landscape provide a different meaning if a specific building was not present in a landscape, such as the lack of a church or lighthouse? As such, a building's centrality within a landscape may also provide the impetus (or cultural motives; McKercher, 2002) for visiting a cultural landscape. Given the relatively high rating of the importance of the social consideration "being most visited by the public" to both community groups and technical experts, additional research is needed to explore: (a) how centrality and visitation might be related, and (b) how stakeholder groups view the importance of the centrality of a building within a landscape.

Interestingly, the economic considerations—in particular, adaptation and future maintenance costs, and, to a lesser extent, prior investment costs—were not viewed as being very important prioritization considerations. The implications of this finding are substantial, for as climate change impacts are realized, more cultural heritage will become vulnerable and the time in which actions can be applied shortens (Graham et al., 2017; Rockman et al., 2016). Moreover, the availability of funding is a concern for practitioners (Fatorić and Seekamp, 2017b; Sesana et al., 2018), and managers have already been making decisions about which cultural heritage to maintain and the sustainability of their investments (Fatorić and Seekamp, 2017b). As such, it seems that although costs may not be perceived as the most important considerations for prioritization decisions, omitting cost considerations in decision-making is infeasible in most circumstances (with the exception of determining fundraising priorities for climate adaptation).[7]

Additionally, it is worth noting that previous investments in preservation was a moderately important consideration for community groups (but not technical experts; $p < .01$), which could suggest a preference for reinvesting in historic buildings that are in relatively good condition for adaptation, some degree of satisfaction with prior funding

[5] For more information on *Antiquities Act of 1906*, see http://www.cr.nps.gov/local-law/anti1906.htm; on *Historic Sites Act of 1935*, see http://www.nps.gov/history/local-law/FHPL_HistSites.pdf; and on *National Historic Preservation Act of 1966*, see http://www.nps.gov/history/local-law/FHPL_HistPrsrvt.pdf.

[6] The difference among community groups may be explained by longer occupational history of families within the Portsmouth Historic District and the greater proportion of respondents who were former (or had family that was) owners or lessees of the buildings among the FPI community group compared to the CS community group.

[7] One of this paper's peer reviewers suggested that given the high importance of historic and social considerations and lower importance of economic considerations across our samples, managers could use this information to guide "intentionality" decisions. Specifically, a building may have high historic and social value and, therefore, is recommended for adaptation even when funding is not available. We found this idea particularly intriguing but recommend that the utility of such type of decision-making be explored in future research.

decisions, or both.[8] Alternatively, this finding may represent a real difference in perceptions between experts and community members that could be related to the geographical scope of interest (i.e., region or nation for experts versus local for community groups). Regardless, any lack of transparency in the ways in which costs are incorporated into decision-making could open the door to litigation (Irvin and Stansbury, 2004), particularly by communities whose cultural heritage is linked to resources not being prioritized for adaptation interventions.

5. Limitations

The exploratory nature of this study presents several limitations that may be overcome in future studies. For example, our sample of community-related stakeholders are limited to one specific, regional context: Cape Lookout National Seashore. Additional research is needed to explore the similarities in value-based priorities for adaptation of historic buildings located in other vulnerable coastal locations. For example, multiple case study research could better assess the extent to which priorities are shared among local community groups at larger spatial scale, while at the same time possibly expanding the types of prioritization considerations presented to community groups, incorporating economic allocation scenarios, or both. That said, the two separate historic districts at Cape Lookout National Seashore are associated with two distinct community groups, which enhances the transferability of our findings to other vulnerable coastal regions with similar maritime heritages. Yet, the nonprobability samples and inability to conduct nonresponse bias tests challenges generalizability to larger populations of experts and community groups, as well as the value of significance testing. These issues may continue to plague future research efforts, as there isn't necessarily uniformity across heritage experts in terms of ascription to a specific professional association and randomly sampling some members of a community group may create equity issues if the findings are used to inform management actions on public lands. Given these ongoing challenges, replication of this study—particularly, with multiple case study research—could help build further confidence in the validity and reliability of our findings. Currently, the strength of our findings may be best demonstrated by the degree to which technical experts' and community group members' opinions were shared despite the minimal overlap in their spatial focus and extent of heritage management decision-making.

6. Concluding remarks

As climate change accelerates the potential for heritage losses, researchers are developing frameworks informed by decision sciences that integrate vulnerability assessment data with assessments of heritage values. We recognize the importance of these complex, data-driven models; however, more timely guidance for setting adaptation priorities—that is also informed by expert and stakeholder values—is needed for managers to begin implementing adaptation strategies. In this paper, we sought to identify and compare the most important considerations for prioritizing historic buildings for coastal adaptation as perceived by technical experts and community groups. Our exploratory results demonstrate fairly consistent evaluations of the perceived importance of adaptation priorities by two samples of experts and members of two community groups associated with historic districts. Specifically, our findings highlight the importance of unique, nationally significant, and scientifically valuable historic buildings that hold meaning to a community of individuals, while downplaying the importance of the costs associated with adaptation and ongoing maintenance of these heritage resources. Despite these consistencies, we found a few statistically significant differences were found between our expert and community group samples. Therefore, we encourage managers to consider stakeholder values alongside technical expertise, particularly when climate change impacts are less imminent and timing allows for engagement with community groups. We also encourage managers to ensure transparency of the economic (in)feasibility of any coastal adaptation decisions given the scarcity of fiscal resources for implementing actions and the potential for conflict surrounding heritage that hold deep cultural meaning.

Author contributions

All authors contributed equally to this article. Seekamp designed the research studies and lead the writing of the manuscript. Fatorić conducted data collection and analysis, and lead the writing of the literature review. McCreary conducted data collection and analysis, and lead the writing of the methods.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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[8] These suggestions also reflect the finding that Friends of Portsmouth Island Community Group sample rated previously having a preservation treatment than the Core Sound Community Group sample ($p < .05$) and the local context in which more buildings—particularly community buildings—have received recent or ongoing preservation treatments in the Portsmouth Historic District than in the Cape Lookout Historic District.

Appendix. Table displaying descriptive statistics by samples and subsamples on considerations for historic preservation prioritization

Preservation Considerations[a]	Full sample	Subsample: Experts	Subsample: Community Group	NPS-identified Experts	CNH-identified Experts	FPI Community Group	CS Community Group
	mean[b], median (SD)	mean[b], median (SD)	mean[b], median (SD)	mean[b], median (SD)	mean[b], median (SD)	mean[b], median (SD)	mean, median (SD)
	n = 265	n = 62	n = 203	n = 39	n = 23	n = 87	n = 116
Economic Considerations							
Previously had previous preservation treatment[c]	3.37, 3.00 (1.11)	2.90, 3.00 (1.08)	3.51, 4.00 (1.09)	2.89, 3.00 (1.16)	2.91, 3.00 (0.95)	3.69, 4.00 (1.07)	3.37, 3.00 (1.08)
Have the least expensive treatment(s)[d]	2.75, 3.00 (1.11)	2.71, 3.00 (1.10)	2.76, 3.00 (1.12)	2.55, 2.50 (1.13)	2.96, 3.00 (1.02)	2.91, 3.00 (1.11)	2.65, 2.50 (1.11)
Are the least expensive to maintain in the future	2.87, 3.00 (1.10)	2.89, 3.00 (1.11)	2.87, 3.00 (1.09)	2.76, 3.00 (1.22)	3.09, 3.00 (0.90)	2.94, 3.00 (1.09)	2.81, 3.00 (1.10)
Provide significant tourism revenue to local communities		3.92, 4.00 (0.89)		3.84, 4.00 (0.92)	4.04, 4.00 (0.88)		
Social Considerations							
Are meaningful to a few people (a family)	2.84, 3.00 (1.05)	2.52, 3.00 (0.85)	2.94, 3.00 (1.08)	2.45, 2.50 (0.89)	2.65, 3.00 (0.78)	3.16, 3.00 (1.07)	2.77, 2.50 (1.07)
Are meaningful to a community of people	4.00, 4.00 (0.99)	4.09, 4.00 (0.85)	3.98, 4.00 (1.03)	4.00, 4.00 (0.87)	4.26, 4.00 (0.81)	4.14, 4.00 (0.95)	3.85, 4.00 (1.07)
Are the most visited by the public	3.89, 4.00 (1.03)	3.98, 4.00 (0.74)	3.87, 4.00 (1.09)	3.89, 4.00 (0.65)	4.13, 4.00 (0.87)	4.06, 4.00 (1.02)	3.72, 4.00 (1.14)
Scientific Considerations							
Have the highest scientific value (help us better understand aspects of the past)	4.00**, 4.00 (0.90)	4.25, 4.00 (0.69)	3.93, 4.00 (0.94)	4.32, 4.00 (0.66)	4.13, 4.00 (0.76)	4.02, 4.00 (0.91)	3.85, 4.00 (0.96)
Historic Considerations							
Hold particular historical value because of its uniqueness (e.g., only one like it).	4.39, 5.00 (0.87)	4.44, 5.00 (0.79)	4.37*, 5.00 (0.89)	4.55, 5.00 (0.56)	4.26, 5.00 (1.05)	4.53, 5.00 (0.76)	4.25, 5.00 (0.96)
Symbolize something of national importance	4.37**, 5.00 (0.88)	4.64, 5.00 (0.58)	4.29, 5.00 (0.94)	4.74, 5.00 (0.50)	4.48, 5.00 (0.67)	4.33, 5.00 (0.91)	4.25, 5.00 (0.97)
Represent the foundation of a community (e.g., is the reason other structures were built).		4.19, 4.00 (0.73)		4.11, 4.00 (0.73)	4.35, 4.00 (0.71)		
Play a central role in the cultural landscape (e.g., prominent)		4.23, 4.00 (0.62)		4.21, 4.00 (0.62)	4.26, 4.00 (0.62)		
Utilitarian Considerations							
Serve a programmatic function (e.g., contributing factor to the designation of the site)		3.98, 4.00 (0.72)		4.08, 4.00 (0.67)	3.83, 4.00 (0.78)		
Hold the highest interpretive potential (e.g., link to the site's interpretive plan)		4.08, 4.00 (0.76)		4.08, 4.00 (0.71)	4.09, 4.00 (0.85)		
Hold an operational purpose (e.g., currently serves as a visitor center)		3.25, 3.00 (0.91)		3.21, 3.00 (0.91)	3.30, 4.00 (0.93)		
Vulnerability Considerations							
Are the most vulnerable to sea level rise (severity of risk).		3.93, 4.00 (0.87)		3.89, 4.00 (0.86)	4.00, 4.00 (0.91)		
Are the most vulnerable to storm-related flooding and erosion (severity of risk).		3.97, 4.00 (0.88)		3.95, 4.00 (0.86)	4.00, 4.00 (0.91)		
Will have the most immediate sea level rise impacts (urgency of action).		4.15, 4.00 (0.89)		4.08, 4.00 (0.82)	4.26, 5.00 (1.01)		
Will have the most immediate storm-related flooding and erosion impacts (urgency of action).		4.18, 4.00 (0.81)		4.16, 4.00 (0.68)	4.22, 4.00 (0.99)		
Are the most vulnerable due to deferred maintenance.		3.56, 4.00 (0.92)		3.45, 3.00 (0.95)	3.74, 4.00 (0.86)		

[a] The question items followed the lead-in question, *How important is it that prioritization be placed on structures that ….*

[b] 5-point response scale: (1) not at all important, (2) slightly important, (3) moderately important, (4) very important, (5) extremely important. It is important to note that caution is needed when interpreting the measures of central tendency reported, as Likert-type scales don't truly enable these statistics (i.e., not true interval variables). However, it is customary in applied social science research within the parks, recreation and human dimensions field (to which all of the authors ascribe) to treat the variables we use (at the observed levels) more as "imperfect interval level scales" (Vaske, J. 2008. *Survey Research and Analysis: Applications in Parks, Recreation and Human Dimensions*. State College, PA: Ventura Publication).

[c] Question item wording was slightly different on the community group instruments ("have been previously restored"), as it was determined that the term "preservation treatment" may not be clear to respondents.

[d] Question item wording was slightly different on the community group instruments ("are the least expensive to restore", as it was determined that the term "preservation treatment" may not be clear to respondents.

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